



Oral glucose efficacy on neonate's pain responses at the NICU: A quasi experimental trial of two clinical procedures ^{☆,☆☆,★}



Eman M. Matar, PhD, RN ^a,

Diana H. Arabiat, PhD, MSc, PG Cert, RN ^{b,c,*}, Mandie J. Foster, PhD, PG Dip, PG Cert, RN ^b

^a Faculty of Nursing, Cairo University, Egypt

^b School of Nursing and Midwifery, Edith Cowan University, Perth, Western Australia

^c Faculty of Nursing, The University of Jordan, Amman, Jordan

ARTICLE INFO

Article history:

Received 14 October 2015

Revised 4 April 2016

Accepted 5 April 2016

Available online xxxx

Keywords:

Oral glucose

Painful procedure

Neonates

NPAS

NICU

ABSTRACT

Aim: This research was undertaken with the purpose of testing two research hypotheses regarding the efficacy of 10% oral glucose solution on procedural pain associated with venepuncture and nasopharyngeal suctioning within three neonatal intensive care units (NICU). The hypotheses were formulated from previous conclusions reached by other researchers highlighting the efficacy of sucrose solutions on neonates' pain responses during minor painful procedures.

Method: A quasi-experimental trial utilising a time series design with one group was used. Data from a total of 90 neonates included 60 neonates who underwent a venepuncture and 30 neonates who underwent a nasopharyngeal suctioning procedure for clinical purposes. The neonate's pain response for each procedure was scored using the Neonatal Pain Assessment Scale (NPAS) on two separate occasions over three time periods. The pre-procedural score (T_0) when the neonate received no sucrose, the inter-procedural score (T_1) when the neonate was given 2 ml of 10% glucose solution two minutes before the procedure (intervention group) or where oral glucose was withheld (control group) and the post-procedural score (T_2) being at the end of the procedure.

Results: The results showed the mean NPAS scores in response to venepuncture or nasopharyngeal suctioning were significantly lower in the intervention group than the control group.

Conclusion: This showed that oral glucose (10%) had a positive effect on the pain response during venepuncture and nasopharyngeal suctioning procedures.

© 2016 Elsevier Inc. All rights reserved.

1. Introduction and background

Neonates are often exposed to a high number of painful procedures such as suctioning, venepuncture or heel lancet procedures as part of their routine care within a neonatal intensive care unit (NICU). It is believed that approximately 10% of infants receive more than 300 painful procedures within the first few weeks of life (Clifford, 2008; Gibbins & Stevens, 2001). The prevention of pain is important, not only because it is an ethical expectation but also because untreated pain in newborns

may result in increased morbidity, prolonged hospitalisation and adverse health outcomes (Corderol, Villar, García, López, & Baeza, 2014).

Hockenberry and Wilson (2012) state that pain is an unpleasant sensory and emotional experience associated with actual or potential tissue damage. The subsequent effects of pain may include physiologic instability; such as an increase or decrease in heart rate, respiratory rate, blood pressure or decrease in oxygenation and haemodynamic stability (Bauer, Ketteler, Hellwig, Laurenz, & Versmold, 2004). The long term consequences of repeated pain may include emotional, behavioural and learning disabilities with subsequent altered psychosocial development (Efe & Ozer, 2007; Stevens, Yamada, Lee, & Ohlsson, 2013).

Bindler, Ball, London, and Ladewig (2011) contend that every neonate has the right to receive effective pain assessment and management. The goal of pain management is to minimize the amount, duration and severity of pain and to assist the newborn to utilise effective coping strategies (Stevens et al., 2013). In this perspective, it is the nurses' responsibility to assess pain in the newborn and to take the appropriate measures to prevent, relieve and control any discomfort associated with clinical procedures (Stevens et al., 2013). Optimal pain management in neonates requires competent pain assessment

[☆] Conflicts of Interest: "The authors have no conflicts of interest to disclose."

^{☆☆} Ethical Approval: All identifying information regarding the study participants has been omitted and this study was approved by the Academic Research Committee of Hail University and Cairo University. Institutional Review Board (IRB) was obtained from each hospital prior to data conclusion. The parents of the neonates were asked to give their verbal consent to their children's participation in the study before inclusion.

[★] Funding/Sponsorship: This research was supported by Hail University in Saudi Arabia and Cairo University in Egypt.

* Corresponding author at: School of Nursing and Midwifery, Faculty of Health, Engineering and Science, Edith Cowan University, 270 Joondalup Drive, Joondalup WA 6027. Tel.: +61 415875977.

E-mail address: d.arabiat@ecu.edu.au (D.H. Arabiat).

informed through physiological and behavioural factors (Spasojevic & Bregun-doronjski, 2011).

The use of an oral sucrose solution in neonates in conjunction with other behavioural interventions such as facilitated tucking and kangaroo care has been suggested as effective measures for pain management in neonates (Axelin, Salantera, & Lehtonen, 2006; Liaw et al., 2012). The administration of an oral sucrose solution has been shown to significantly reduce pain in neonates from single painful events such as venepuncture or heel lancet procedures (Acharya, Annamali, Taub, & Field, 2004; Benis, 2002). However, less is known about the efficacy of oral glucose administration for other minor painful procedures such as nasal or tracheal suctioning procedures (Stevens et al., 2013).

The administration of oral sweet solutions as an analgesic adjunct for infants during painful procedures is a new approach in pain management. It is suggested that the sweet taste of oral glucose solutions induces the release of endogenous opioids (Mitchell & Waltman, 2003). Gibbins's (2003) states the analgesic effects of glucose are rapid, enduring and dependent on the ability of the infant to detect the sweet taste. The peak effect of oral glucose solutions is approximately two minutes after administration that can last up to five to ten minutes post administration (Hutchinson & Hall, 2005).

Given the fact that oral glucose solution seems to reduce pain and may be a useful and safe analgesic for minor procedures in neonates during venepuncture and lancet procedures (Acharya et al., 2004; Benis, 2002; Stevens et al., 2013), this study aimed to add to the existing body of knowledge regarding the efficacy of oral sucrose solutions on neonates pain responses during venepuncture and nasopharyngeal suctioning procedures. It is essential that nurses become aware of effective procedural pain strategies and translate this knowledge into clinical practice (Corderol et al., 2014). This research was undertaken with the purpose of testing two research hypotheses regarding the efficacy of a 10% oral glucose solution on procedural pain associated with venepuncture and nasopharyngeal suctioning within three NICUs in the Middle East. It is hypothesized that 1. newborn babies who receive oral glucose 10% prior to venepuncture will have a reduced pain response as measured on the NPAS than their control group and 2. newborn babies who receive oral glucose 10% prior to nasopharyngeal suctioning will have a reduced pain response as measured on the NPAS than their control group.

2. Method

2.1. Design and settings

A quasi-experimental trial with one group time series design.

2.2. Participants

During December 2011 to July 2013, 90 neonates from three NICUs were enrolled in this study. These hospitals were the maternity and children's hospital in Hail/ Saudi Arabia and the Kasr El Aini and El Monira Hospital/Cairo in Egypt. Eligibility criteria included a gestational age of 32 weeks or more and informed parental consent. Exclusion criteria included neonates of diabetic mothers or who required respiratory support, had neurological deficits or received sedation or analgesia 24 hours prior to recruitment.

2.3. Procedure

Data included 60 neonates undergoing venepuncture and 30 neonates undergoing nasopharyngeal suctioning for clinical purposes. Pain was evaluated using a valid pain scale at three time frames (start of procedure – T_0 , maximal response – T_1 , end of procedure – T_2). The data were collected and recorded on two separate occasions where no oral glucose was given to the neonate prior to the procedure (control group) and on another occasion where the neonate received one dose

of 2 ml of oral 10% glucose solution two minutes before the painful procedure (intervention group). All nasopharyngeal suctioning and venepuncture procedures in the study were performed for clinical purposes only. All procedures were videotaped and the data were collected and recorded by the first author (E.M).

2.4. Ethical issues

This study was approved by the local Ethical Committee of Hail University and Cairo University. Institutional Review Board (IRB) approval was obtained from each hospital prior to data collection. The parents of the neonates gave informed verbal consent prior to their children's participation in the study.

2.5. Measurements

Additional demographic details including the gestational age, gender, diagnosis, weight and age of the neonate were collected. The variables of the study included the physiological items as reflected in the neonate's pulse, respiration, blood pressure and oxygen saturation. These were measured on an ECG monitor. Behavioural clues were reflected in the cry, facial expression, consolability and overall tone. All of these variables were collected, recorded and analysed over three time periods (T_0 , T_1 , T_2) on two separate occasions (control, intervention).

The NPAS developed by Susan Givens Bell (1993–1994) was used to measure the pain score from the venepuncture or nasopharyngeal suctioning procedure. The NPAS is multidimensional because it assesses both the behavioural signs (sleep, facial expression, motor activity, cry and consolability) and physiological signs (pulse, respiration, blood pressure and oxygen saturation) as illustrated in Table 1 (Spasojevic & Bregun-doronjski, 2011). The NPAS is a suitable, valid and reliable tool (Duhn & Medves, 2004; Spasojevic & Bregun-doronjski, 2011; Tietjen, 2001). The mean pain score for the neonates is estimated by giving a score of 0, 0.5 or 1 to each item on the NPAS scale. The NPAS score ranges from 0 to 10 where a score of 0 to 2.5 is considered as adequate pain control and a score over 2.5 is considered to have inadequate pain control.

2.6. Data analysis

The Statistical Package for Social Sciences (SPSS 19.0, Chicago, IL, USA) was used to perform statistical analysis. The relationship between the NPAS scores for both procedures and groups was examined using the t-test and chi-square analyses. Descriptive statistics included frequencies, percentages, figures and tables to illustrate the differences in the NPAS scores for the two different procedures over the three timeframes. A p value of ≤ 0.05 and $p \leq 0.001$ was considered statistically significant.

3. Results

The mean birth weight and gestational age of the 90 neonates were 1.370 ± 227 grams and 35.1 ± 3.0 weeks, respectively. The majority of the neonates in the study were male ($n = 60$, 67%) with 33% being female ($n = 30$). Approximately 60% of the neonates were diagnosed with respiratory distress while 20% were diagnosed with a meconium aspirate syndrome.

Statistically significant differences were noted between the NPAS scores for the intervention and control groups in relation to the oral administration of 10% glucose. The average NPAS score for both the venepuncture and nasopharyngeal suctioning procedure was significantly lower after the ingestion of 2 ml of oral 10% glucose solution as illustrated in Fig. 1.

Significantly less neonates in the intervention group were scored as having less pain (NPAS > 2.5) at T_1 : 73% compared with 38% in the

دانلود مقاله



<http://daneshyari.com/article/2644768>



- ✓ امکان دانلود نسخه تمام متن مقالات انگلیسی
- ✓ امکان دانلود نسخه ترجمه شده مقالات
- ✓ پذیرش سفارش ترجمه تخصصی
- ✓ امکان جستجو در آرشیو جامعی از صدها موضوع و هزاران مقاله
- ✓ امکان پرداخت اینترنتی با کلیه کارت های عضو شتاب
- ✓ دانلود فوری مقاله پس از پرداخت آنلاین
- ✓ پشتیبانی کامل خرید با بهره مندی از سیستم هوشمند رهگیری سفارشات